

I claim:

1. A microfine polyethylene powder comprised of particles which are spherical  
5 or substantially spherical in shape and having an average particle size from 1 to 5  
microns and wherein 80 percent or more of the particles range in size from 0.1 to 7  
microns, said polyethylene powder having a weight average molecular weight from  
20000 to 55000 g/mol and density from 0.895 to 0.925 g/cm<sup>3</sup>.
- 10 2. The microfine powder of Claim 1 wherein the polyethylene is an ethylene  
homopolymer having a Brookfield viscosity in the range 4000 to 10000 centipoise.
3. The microfine powder of Claim 2 wherein the ethylene homopolymer has a  
weight average molecular weight from 30000 to 50000 g/mol.
- 15 4. The microfine powder of Claim 3 wherein the ethylene homopolymer has a  
density from 0.899 to 0.920 g/cm<sup>3</sup>.
5. The microfine powder of Claim 3 wherein the ethylene homopolymer has a  
20 Brookfield viscosity in the range 6000 to 9000 centipoise.
6. The microfine powder of Claim 1 having an average particle size of 2 to 4  
microns.
- 25 7. The microfine powder of Claim 6 wherein 80 percent or more of the particles  
range in size from 0.5 to 5 microns.
8. The microfine powder of Claim 1 produced in an aqueous dispersion process.

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9. The microfine powder of Claim 8 produced by  
(a) combining a polyethylene resin having a weight average molecular weight from 20000 to 55000 g/mol and density from 0.895 to 0.925 g/cm<sup>3</sup> with a nonionic surfactant and polar liquid medium containing at least 50 weight percent water;  
5 (b) heating the mixture above the melting point of the polyethylene resin;  
(c) agitating the mixture to disperse the polyethylene in the polar liquid medium;  
(d) cooling the dispersion below the melting point of the polyethylene resin;  
and  
10 (e) recovering the microfine powder.

10. The microfine powder of Claim 9 produced by the process wherein the weight ratio of polar liquid medium to polyethylene resin is from 0.8:1 to 9:1 and the nonionic surfactant is employed in an amount from 4 to 50 weight percent, based on  
15 the weight of the polyethylene resin.

11. The microfine powder of Claim 10 produced by the process wherein the mixture is heated to 90°C to 250°C, the agitator tip speed is from 500 to 3500 ft/min and the nonionic surfactant is a block copolymer of ethylene oxide and propylene  
20 oxide having a molecular weight greater than 3500.

12. The microfine powder of Claim 11 produced by the process wherein the dispersion from (d) is washed and concentrated by high shear membrane filtration prior to recovery of the microfine powder.  
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